

Sediment Quality Objectives for the Protection of Human Health (Indirect Effects)

The Human Health Sediment Quality Objective (HHSQO) was developed in accordance with the *Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality* (State Water Resources Control Board (SWRCB)), which describes a general approach based on human health risk assessment. The SWRCB recently approved and adopted the full HHSQO under Resolution No. 2018-0028, Amendments to the Water Quality Control Plan for Enclosed Bays and Estuaries – Part 1 Sediment Quality (Sediment Quality Provisions); however, these amendments are currently pending approval by the California Office of Administrative Law and the U.S. Environmental Protection Agency (USEPA). The 2018 changes to the Plan include detailed procedures and requirements for conducting an HHSQO assessment; the Plan also describes how an indirect effects assessment evaluates the potential for contaminants in sediment within a site to accumulate in seafood to levels that can cause an unacceptable chemical exposure risk through human seafood consumption.

The HHSQO assessment process involves a tiered site assessment process for evaluating whether site sediments meet the HHSQO and are therefore protective of human consumers of locally caught seafood. Tier I is a screening level assessment of existing site data to determine if further evaluation is needed. Tier II is a general but complete site assessment of sediment quality involving the evaluation of the chemical exposure and separately the linkage between sediment bioaccumulatives and seafood tissue concentrations using a bioaccumulation model with some site-specific inputs. Tier III is a more site-specific assessment process, which may be most applicable to complex sites with challenging site conditions. Regardless of the tier, the assessment involves integration of the following two components:

1. Chemical exposure, which is measured by evaluating pollutant concentrations in sportfish to determine if concentrations are associated with unacceptable chemical exposure to human consumers
2. Site sediment linkage, defined by the contribution of sediment contamination from the site to seafood contamination levels within the site

Specifically, the site chemical exposure and sediment linkage levels are categorized and evaluated using a decision matrix to determine if the HHSQO is attained. The potential outcomes of the decision matrix are: Unimpacted, Likely Unimpacted, Possibly Impacted, Likely Impacted, and Clearly Impacted.

Site Assessment Categories

| | | Chemical Exposure | | | | |
|-----------------------|----------|-------------------|----------------------|----------------------|----------------------|----------------------|
| | | Very Low | Low | Moderate | High | Very High |
| Site Sediment Linkage | Very Low | Unimpacted | Unimpacted | Likely Unimpacted | Likely Unimpacted | Likely Unimpacted |
| | Low | Unimpacted | Unimpacted | Likely Unimpacted | Possibly Impacted | Likely Impacted |
| | Moderate | Unimpacted | Likely Unimpacted | Likely Impacted | Likely Impacted | Clearly Impacted |
| | High | Unimpacted | Likely Unimpacted | Likely Impacted | Clearly Impacted | Clearly Impacted |